DIGITAL OIL PRESET METER

OWNER'S MANUAL

⚠ **WARNING: Read carefully and understand all INSTRUCTIONS before operating. Failure to follow the safety rules and other basic safety precautions may result in serious personal injury.**

Item #109619

Thank you very much for choosing a NORTHERN TOOL + EQUIPMENT CO., INC. Product! For future reference, please complete the owner's record below:

Model: _____ Purchase Date: _____

Save the receipt, warranty and these instructions. It is important that you read the entire manual to become familiar with this product before you begin using it.

This machine is designed for certain applications only. Northern Tool + Equipment cannot be responsible for issues arising from modification. We strongly recommend this machine is not modified and/or used for any application other than that for which it was designed. If you have any questions relative to a particular application, DO NOT use the machine until you have first contacted Northern Tool + Equipment to determine if it can or should be performed on the product.

For technical questions, please call **1-800-222-5381**.

INTENDED USE

Oil preset meter can be used to dispense motor oil. With the pre-selected function, the nozzle automatically closes the valve and stops dispensing.

TECHNICAL SPECIFICATIONS

Item No.	109619
Flow Range	0.3-9.2 GPM
Operating Pressure Range	7-1000 PSI
Operating Temperature	Max. 140°F
Accuracy	±5%
Viscosity	8-5000 mPas
5-Digital LCD Display (3/8"H x 3/16"W)	Quart, Pint, Gallon, Liter
Inlet Connection	1/2" NPT Female
Power Source	4 AA size 1.5V Batteries

*Tested with DTE-25 motor oil at ambient temperature. Min.-Max. flow range will vary with fluid viscosity.

GENERAL SAFETY RULES

WARNING: Read and understand all instructions. Failure to follow all instructions listed below may result in electric shock, fire and/or serious injury.

WARNING: The warnings, cautions, and instructions discussed in this instruction manual cannot cover all possible conditions or situations that could occur. It must be understood by the operator that common sense and caution are factors that cannot be built into this product, but must be supplied by the operator.

SAVE THESE INSTRUCTIONS

WORK AREA

- **Keep work area clean,** free of clutter and well lit. Cluttered and dark work areas can cause accidents.
- **Do not use your meter where there is a risk of causing a fire or an explosion;** e.g. in the presence of flammable liquids, gasses, or dust. Power tools create sparks, which may ignite the dust or fumes.
- **Keep children and bystanders** away while operating this meter. Distractions can cause you to lose control, so visitors should remain at a safe distance from the work area.
- **Be aware of all power lines, electrical circuits,** water pipes and other mechanical hazards in your work area, particularly those hazards below the work surface hidden from the operator's view that may be unintentionally contacted and may cause personal harm or property damage.
- **Be alert of your surroundings.** Using tools in confined work areas may put you in danger.

PERSONAL SAFETY

- **Stay alert,** watch what you are doing and use common sense when operating this meter. Do not use this meter while you are tired or under the influence of drugs, alcohol or medication. A moment of inattention while operating this meter may result in serious personal injury.
- **Dress properly.** Do not wear loose clothing, dangling objects, or jewelry. Keep your hair, clothing and gloves away from moving parts. Loose clothes, jewelry or long hair can be caught in moving parts. Air vents often cover moving parts and should be avoided.
- **Use safety apparel and equipment.** Use safety goggles or safety glasses with side shields which comply with current national standards, or when needed, a face shield. This applies to all persons in the work area. Also use non-skid safety shoes, hardhat, gloves, dust collection systems, and hearing protection when appropriate.
- **Do not overreach.** Keep proper footing and balance at all times.
- **The meter is for professional use only.**
- **Read all instructions**, tags, and labels before operating the meter.
- **Use the meter only for its intended purpose.**
- **Do NOT stop or deflect leaks** with hands, body, gloves, or rags.
- **Do NOT dispense valves** toward any person or any part of the body.
- **Do NOT place hands or fingers** over the end of or into the dispense valve.

FACTORY SETTINGS

- Each meter is preprogrammed and calibrated at the factory. Each meter is programmed in quarts for use with motor oil as standard. The meter is shipped in the Manual Mode.
- The factory preset cannot be changed.

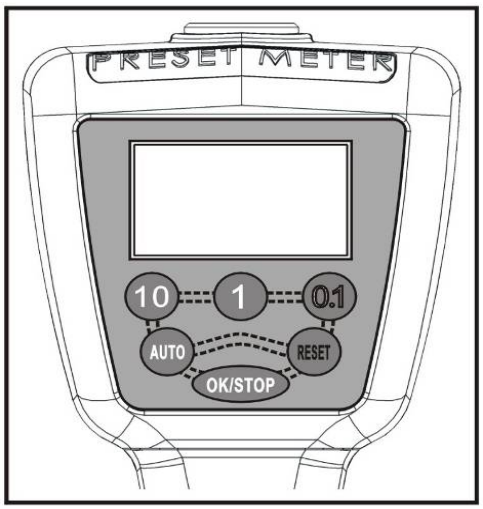
TOOL USE

- DO NOT modify or alter the meter.
- DO NOT leave the meter unattended while dispensing.
- Check the meter daily. Worn or damaged parts should be repaired or replaced immediately.
- DO NOT exceed the maximum working pressure level of the lowest rates system component.
- Use only extensions and nozzles that are compatible with this meter.
- Use only fluids and solvents that are compatible with the equipment. Notice the warnings for fluids and solvents.
- Tighten all fluid connections before operating the meter.
- Comply with all local, state, and federal fire, electrical and safety regulations.
- Use of the product in a manner other than specified in this manual may result in bodily injury or impaired operation or damage to the meter.

OPERATION

The Digital Meter requires 4 AA (1.5V) batteries to operate (batteries included). For battery replacement, refer to Section D, Battery Replacement elsewhere in this manual.

1. Keypad Buttons



10 1 0.1

Press to enter the quantity to be dispensed.

AUTO AUTO

Press to enter and exit the AUTO Mode.

RESET RESET

Press in Manual or AUTO Mode to clear the previously programmed batch and to reset the meter.

OK/STOP OK/STOP

Press to confirm the Valve and to stop the flow through a mechanical override.

2. INSTALLATION

A. Pre-installation Procedure

1) Relieve the system pressure

a) Turn off the power supply to the pump or close the shutoff valve.
b) Dispense any fluid in the system into a waste container by opening the dispense valve.
c) Open all bleed-type master air and fluid drain valve in the system.
d) Leave the drain valve open until ready to pressurize the system.

2) Close the shutoff valve.

3) Ground hoses and reels:

Grounding reduces the risk of static sparking; ground all system components according to local, state, and federal codes. Consult the user's manual on the pump and other system components to ground the following:

a) Pump: follow manufacturer's recommendations.
b) Air and fluid hoses: use only grounded hoses.
c) Air compressor: follow manufacturer's recommendations.
d) Fluid supply container: follow the local code.

⚠ **WARNING** Do not use Teflon tape on pipe joints; it may cause a loss of grounding across the joint.

B. Installation Procedure

1) If the Meter is installed, go directly to step 6. Steps 2 through 5 are for flushing the system prior to installing the meter.
2) Close fluid dispensing valves at every dispensing position.
3) Once the main fluid outlet valve at the pump is closed, the air pressure to the pump motor is properly adjusted, and the air valve is open, slowly open the main fluid valve.
4) Place the hose end in a waste container. Make sure hose is secure in order to ensure no fluid leakage.
5) Open the dispense valve slowly and allow enough oil to pass through to ensure the system clean.
   Note: If the system has multiple dispensed positions, start at the position farthest from the pump, and move toward the pump.
6) Relieve the pressure (refer to Relieve the system pressure, above).
7) Insert the metal end of the hose into the swivel location at the end of the handle; tighten it completely with an open-ended adjustable wrench.

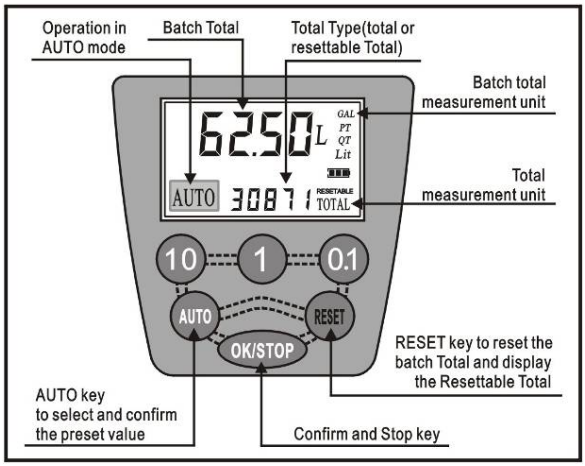
Connecting the hose

   Note: The meter thread is always female, so the thread for the hose should be male. Apply thread sealant to the male end. The inlet and outlet connections are 1/2" NPT or 1/2" BSPT, depending on meter model.
8) Thread the new nozzle into the opposite end of the meter and screw it tightly with an open-ended adjustable wrench.

Installing the nozzle

9) Open all dispense position shut-off valves, and start the pump to pressurize the system.
10) To ensure accuracy, purge all air from the fluid lines and dispense valve before use.

3. OPERATING THE METER



⚠ WARNING

After using the manual anti-drip valve, it is important to discharge the pressure between the chambers (1) and the manual valve (2) of the spout. First, the pump must be switched off. Then, unscrew the tip of the valve (2). During this discharging operation, do not use the trigger (3).

To access the various customizing functions and to select the desired options, **two different actions are indicated on the keys.**

- This symbol indicates that it is necessary **to press** AUTO **briefly,** and afterwards release it.
- This symbol indicates that it is necessary **to press** OK/STOP **and hold on the key** for a few seconds.

To exit from the customization menu, independent of the activity in progress, press RESET. **The settings displayed at that moment immediately become operational.**

A. Display Mode

Start up the Meter by selecting RESET

The Meter displays:

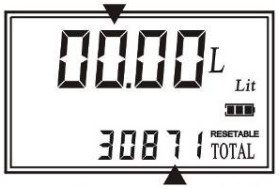
Last amount dispensed

Stored value Total

Press and hold RESET until the counter reads zero.

The Meter will display:

Reset Batch Total



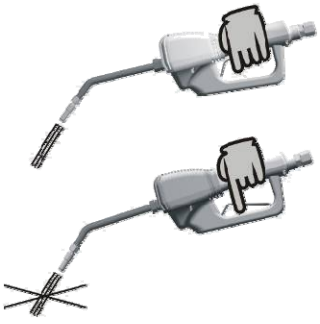
Stored value Total

⚠ WARNING

The stored value total is set as a default in the factory and cannot be changed. If you need to change it, please contact an authorized service center.

Pull the trigger to dispense.

Release the trigger to stop dispensing.

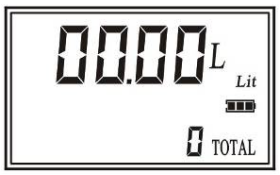


B. Operation Mode

B-1. Manual Mode

Program the Meter to Manual Mode by selecting RESET

The Meter displays:



Manual Mode

Pull the trigger to begin the flow. When the desired amount has been pumped, release the trigger to stop the flow.

Press RESET to reset counter display to zero.

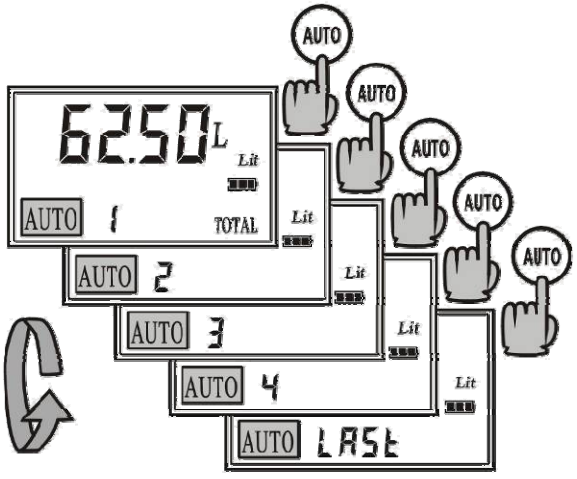
B-2. AUTO Mode

Meter stores: AUTO
1-2-3-4-last: Five different PRESET values which are frequently used.

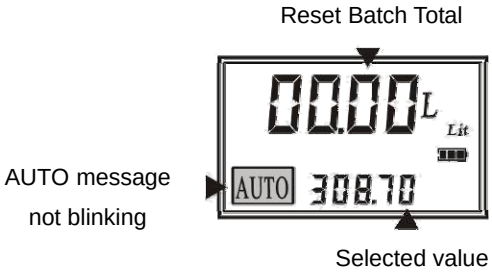
Start up the Meter by selecting RESET

Press AUTO as many times as necessary to reach the desired values and the values are repeated.

Blinking message will be:



To confirm a PRESET value, press and hold OK/STOP until the Meter displays:



To start dispensing, pull the trigger completely, then release.

The trigger thus remains locked in open position. Now dispensing can continue in AUTO mode.

Automatic stop

The flow automatically stops when the preset value is reached.

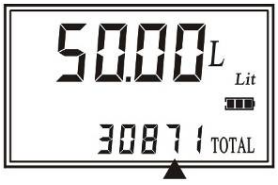
NOTE: If you want to stop dispensing before the preset value is reached, just press OK/STOP **to stop.**

WARNING In all cases, the operator must attend to the Meter while dispensing in AUTO mode in order to avoid any oil spillage.

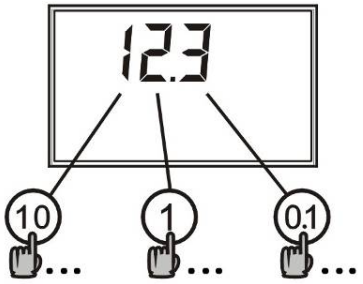
B-3. User Mode

If the Meter is off, press RESET to re-start it.

The value is last amount dispensed, the Meter will display:



To select a new PRESET value (for example, 12.3), press the numeric keys as many times as needed; this value will be LAST mode automatically.

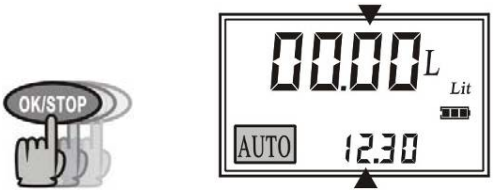


The Meter displays:

Select value

Press OK/STOP and hold until the counter turns to zero.

Reset Batch Total



Selected value

To start dispensing, pull the trigger completely, then release. The flow automatically stops when the preset value is reached.

NOTE: If you want to stop dispensing before the preset value is reached, just press OK/STOP to stop.

C. Preset Values Setting

C-1. Numeric Function

Press and hold on OK/STOP to set the function

Selective key AUTO

Numeric keys 10 1 0.1

Confirm and quit key RESET

Press and hold on OK/STOP to set the function: it contains Value setting (C-2), Unit setting (C-3), Decimal Digits setting (C-4), Reset setting (C-5), Auto reset setting (C-6) and Calibrating setting (C-7).

C-2. Value Setting

The Meter allows the Operator to store 5 different PRESET values (AUTO 1...AUTO 4), which can be recalled without having to set them each time with the numeric keys.

Press and hold OK/STOP once to set the function.

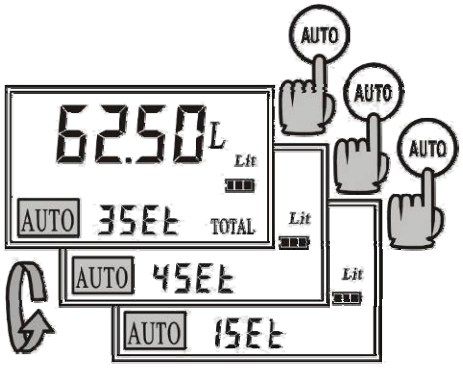
The Meter will display:

Blinking

Index of the PRESET value AUTO 1

When the value is blinking, press AUTO to select preset 1-4, then press the numeric buttons to set the value.

Blinking message will be:



Press RESET to confirm the value and quit the setting mode, the setting value will be stored.

By holding on the keys the value continues to vary.

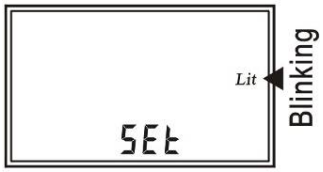
C-3. Unit Setting

The Meter allows the user to select one of the following measurement Units:

- **QTS** = QUARTS
- **PTS** = PINTS
- **LIT** = LITERS
- **GAL** = GALLONS (U.S. Gallons)

Press and hold OK/STOP two times to set the function.

The Meter displays:



When the unit is blinking, press (AUTO) to select unit L, GAL, PT or QT.

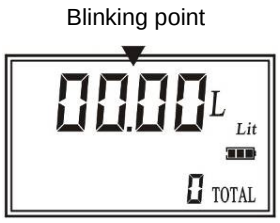
Press (RESET) to confirm the value and quit the setting mode, the setting value will be stored.

NOTE: The above mentioned measurement units refer to the **Batch** total indicators.

- If you select the unit LITERS, **the TOTALS will be displayed in LITERS.**
- If you select the unit GALLONS, PINTS or QUARTS, **the TOTALS will be displayed in GALLONS.**
- The modification of the measurement unit does NOT require a new calibration.
- If the TOTAL indicates a value other than zero, this value is automatically converted from one unit to another unit.

C-4. Decimal Digits Setting

Press and hold (OK/STOP) three times to set the function.



When the number point is blinking, press (AUTO) to select location of the point to confirm the number of decimal digits setting.

Press (RESET) to confirm the value and quit the setting mode. The setting value will be stored.

NOTE:

- **The Meter displays the FLOATING POINT Batch total dispensed.**
- Independent of the selection carried out (two or three decimal digits), as soon as the amount dispensed exceeds 10 units, the Meter displays only **two decimal digits**.
- As soon as the amount dispensed exceeds 99 units, the Meter displays only **one decimal digit**.

C-5. Reset Setting

Press and hold OK/STOP four times to set the function.

The Meter displays:

Blinking

When YES is blinking, press AUTO to select YES or No. If YES the batch total will be set to zero after hold OK/STOP button for 10 seconds, NO to cancel.

Press RESET to confirm the value and quit the setting mode. The setting value will be stored.

NOTE: Independent of the selection carried out, **the Batch Total supplied is never reset if the dispensing operation has been carried out in AUTO mode.**

C-6. Auto Reset Setting

The function described in this paragraph concerns **only those who want to obtain the maximum dispensing stop precision in AUTO mode**.

If a slight excess of the pre-set value (a few hundredths of a quart) does not cause any problem, **the following paragraphs can be ignored**.

The Meter in AUTO mode allows the user to obtain a highly precise stop, thus dispensing exactly the pre-set amount without exceeding the PRESET value.

To guarantee this high stop precision, especially **when the unit operates at the maximum allowed flow rates,** dispensing does not stop when the PRESET value is reached, **but instead when the PRESET value reaches a few Unit hundredths.**

To guarantee the stop precision, **this pre-stop value must not be fixed**, but is dependent on the flow rate used. To allow the operator to obtain the highest stop precision, the unit is equipped with a Stop Precision factor, called **PS factor**.

The operator can customize the Meter to **select a PS factor between ZERO and FOUR**.

By selection:

PS=0 a pre-closing equal to **ZERO** is set.

PS=1

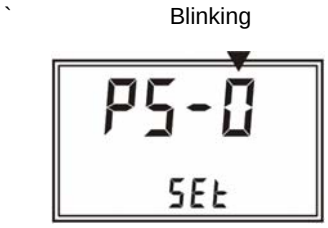
PS=2

PS=3

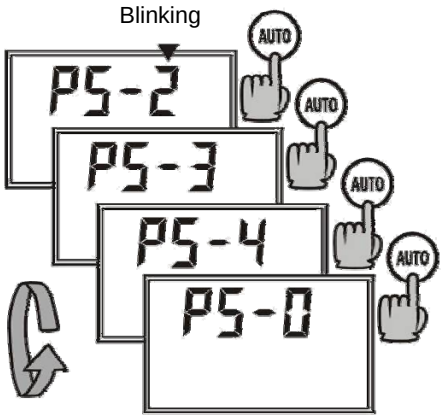
PS=4 the **MAXIMUM** pre-closing is set.

Press and hold OK/STOP five times to set the function.

The METER displays:



When PS factor is blinking, press AUTO to select PS 0-4 to increase the PS factor by one unit.



Press RESET to confirm the value and quit the setting mode. The setting value will be stored.

NOTE: The higher the flow rate, the higher the selected PS value. If you select too high a PS value, the dispensed amount may be lower than the pre-set value by some hundredths of a quart.

C-7.Calibrating Setting

The Meter is equipped with high-precision gears, pre-calibrated in the factory.

Why calibrate?

If the METER is used:

- **With fluids having a viscosity close to the limits of the allowed range** (such as low-viscosity antifreeze fluids or high-viscosity oils for gear boxes).

- **In extreme flow rate conditions** (close to the min. and max. value of the allowed range), **it may be necessary to carry out an on-site calibration**.

How to calibrate

The Meter allows the user to carry out a rapid electronic calibration by modifying the **Calibration factor (K Factor)**.

At delivery all meters are given the same calibration factor:

K Factor = 1.000

This calibration factor guarantees the best accuracy in the following operating conditions:

Fluid: Motor oil type 10W 30

Temperature: 68°F

Flow-rate: 2.6 GPM

The calibration can be done either as:

- An on-site calibration by dispensing into a calibrated container or
- A direct modification of the calibration factor.

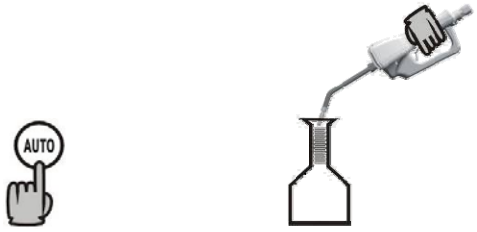
On-site calibration by dispensing into a calibrated container:

Press and hold down OK/STOP six times to set the function.

The METER displays:

Blinking

Press AUTO ; start the calibration by dispensing the fluid into a calibrated container.



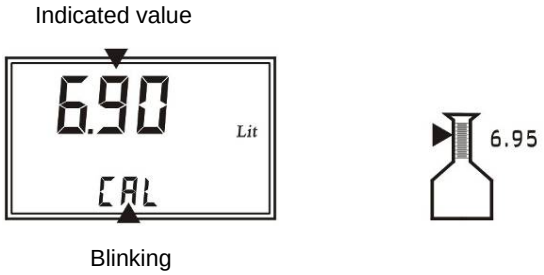
During dispensing the Meter displays:

Batch Total dispensed

Blinking

The dispensing operation may be interrupted and resumed.

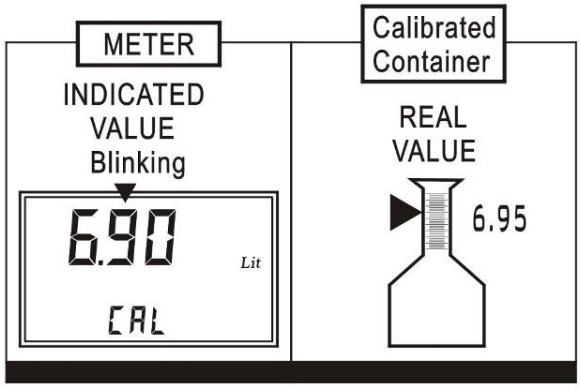
The calibrated dispensing is complete when the level of the fluid reaches the graduated area of the calibrated container.



WARNING In order to get a correct Calibrated K Factor from the meter, ensure calibration capacity is set to more than 5 quarts. Purge all air from the unit before carrying out the calibration.

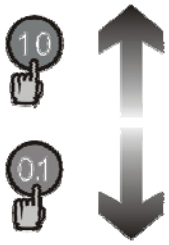
Carry out the calibration dispensing at a steady flow rate by pulling the trigger completely and keeping it in the open position until the container is **nearly full**. Do not reduce the flow rate to reach the graduated area of the calibrated container. Instead, to complete the final stages of the filling operation into the calibrated container, top-off in small increments. This is achieved by rapidly pulling the trigger of the Meter and then releasing it very quickly.

Press AUTO again to modify the value to equal the volume of the calibrated container.



Press key “10” to increase the indicated value.

Press key “0.1” to decrease the indicated value.

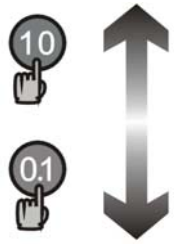


WARNING

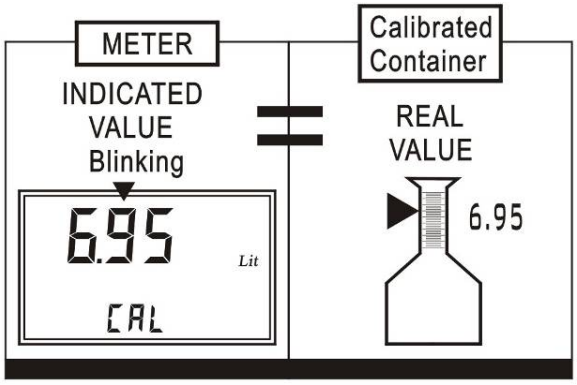
After dispensing, wait a few minutes to allow any air bubbles in the calibrated container to dissipate.

Verify the actual amount dispensed in the calibrated container; as the air bubbles dissipate, the indicated level may decrease. **Do not wait more than 15 minutes as the Meter will exit from the menu and it will no longer be possible to complete the calibration operation.**

The Meter is ready to accept the modification of the **indicated** value to correspond to the **real value**. A key each time is pressed, the last digit on the right is modified under one unit.



After correction:



Press AUTO again, the Meter will calculate the K Factor automatically which is blinking.

The Meter stores the new Calibration Factor (K Factor) and displays:

Blinking New K Factor

After a few seconds, the Meter automatically exits from the customization mode and starts using the new Calibration Factor.

One dispensing operation is enough to carry out the on-site calibration of the meter.
If you wish to verify the result of this calibration, **complete a normal dispensing in the same Calibrated Container** without re-entering the calibration function in the Customization menu.

D. Battery replacement

The Meter continuously controls the battery charging state. As soon as the battery level drops below a

given level, the Meter displays:

Blinking message “bAtt”

As soon as the message “bAtt” appears, displaying in AUTO mode is immediately stopped and it is no longer possible to lock the trigger in open position.

This prevents the unit from continuing to dispense in AUTO mode, even if the PRESET value has been reached, because of an insufficient battery charge.

Even when the message “bAtt” is displayed, it is still possible to carry out dispensing operations in MANUAL mode.

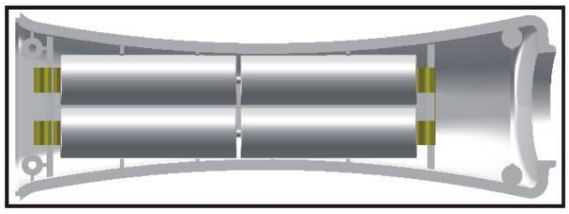
Although it is possible to carry out multiple dispensing operations in MANUAL mode even when the message “bAtt” is being displayed, **the batteries must be replaced as soon as possible to resume the full functioning capacity of this METER** and to avoid the quality of the image on the LCD from deteriorating, thus causing metering errors.

When the message “bAtt” blinks, the TOTAL is **constantly updated**, although not displayed.

To replace the batteries:

1. With a small Phillips screwdriver, loosen the four screws of the battery pack and remove it.

2. Open the battery pack by removing the cover.
3. Remove the used batteries.
4. Install 4 new AA (1.5 Volt alkaline) batteries, paying attention to polarity shown on the cover.



5. Replace the cover again and refasten the four screws.

The Meter will start automatically as soon as the battery pack is fixed, carrying out a short SELF-TEST:

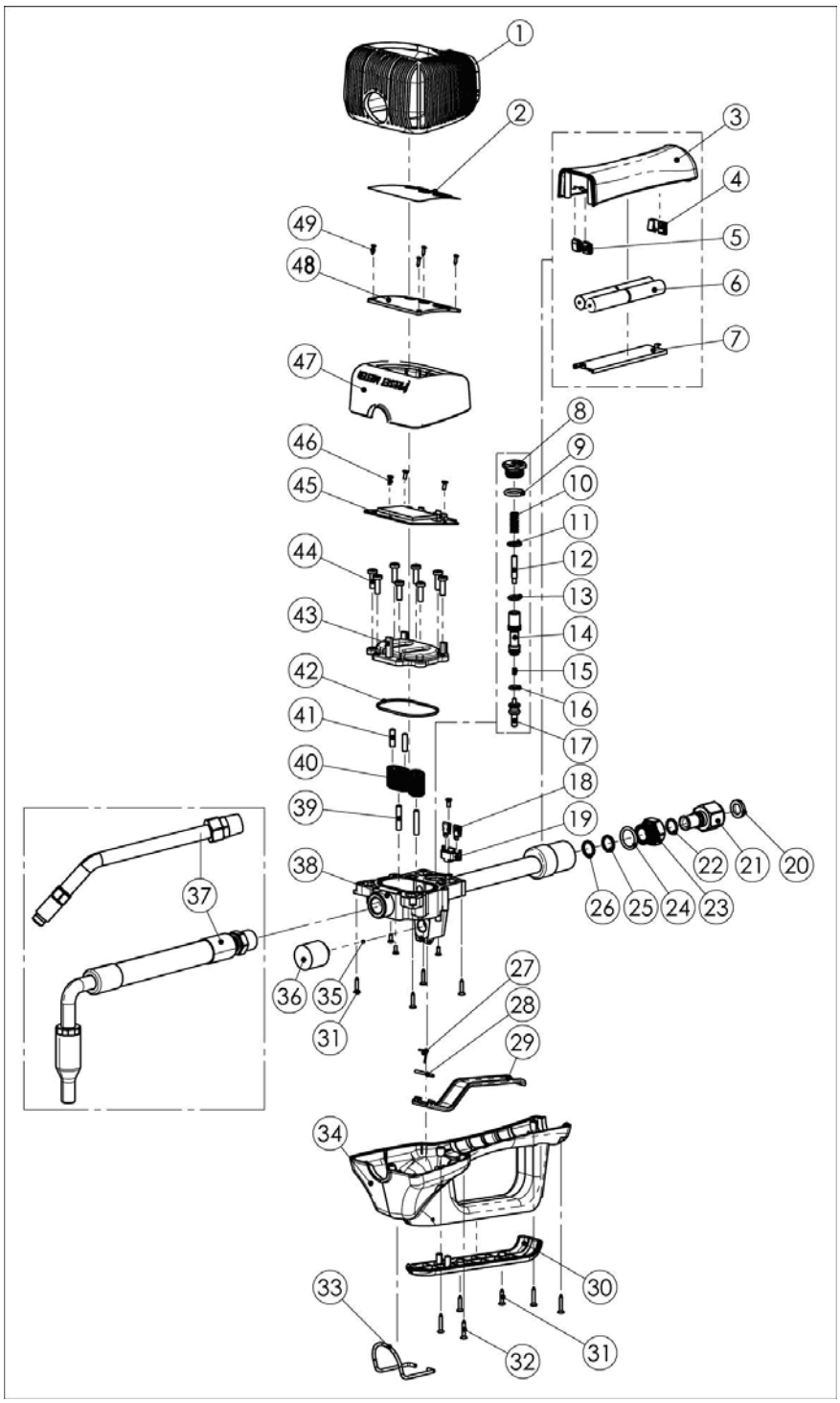
- Complete lighting of LCD
- Complete stop of LCD
- Display of serial number of electronic board

- Normal operation mode

The replacement of the batteries does not cause any data loss. The customization of the Meter, previously set, remains operational.

1. If the meter does not operate for more than 20 seconds, it will return to sleep mode.
2. Please **pause** for more than 30 seconds between reusing AUTO mode.

DIAGRAM & PARTS LIST



Part #	Description	Quantity
1	Rubber Cover	1
2	Lens Cover	1
3	Top Handle	1
4	Doubled Battery Shrapnel	1
5	Recharging Battery Shrapnel	2
6	AA 1.5 Volt Battery	4
7	Battery Cover	1
8	Directive Cover	1
9	O-Ring	1
10	Main Spring	1
11	O-Ring	1
12	Signal Pole	1
13	O-Ring	1
14	Slip Pole	1
15	Sub-Spring	1
16	O-Ring	1
17	Press Pole	1
18	Main Battery Shrapnel	2
19	Bracket	1
20	Filter	1
21	Rotated Linker	1
22	O-Ring	1
23	Linking Nut	1
24	O-Ring	1
25	Block Washer	2
26	Washer	1
27	Handle Spring	1

Part #	Description	Quantity
28	Columned Pin	1
29	Trigger	1
30	Bottom Cover	1
31	Cross Recessed Pan Tapping Screw	6
32	Cross Recessed Pan Tapping Screw	2
33	Hook	1
34	Under-Handle	1
35	Steel Sphere	1
36	Electricity Magnet	1
37	Flexible Spout / Rigid Spout	1
38	Main Body	1
39	Axis	2
40	Ellipse Gear	2
41	Magnet Pole	2
42	O-Ring	1
43	Top Cover	1
44	Cross Recessed Pan Tapping Screw	8
45	PCB Board	1
46	Cross Recessed Pan Tapping Screw	7
47	Front Cover	1
48	Keypad Lens	1
49	Cross Recessed Pan Tapping Screw	4

For replacement parts and technical questions, please call **1-800-222-5381**.

Troubleshooting

Problem	Possible Causes	Solutions
Display is Blinking	1. Meter inactive 2. Batteries low or dead 3. Program error 4. Loose battery connection	1. Press RESET button 2. Replace batteries / Press RESET button 3. Remove and reinsert battery pack / Press RESET button 4. Remove battery pack and check battery connection / Press RESET button
Meter does not latch for batching	1. Meter not in AUTO mode 2. Meter not reset after prior batching 3. Low batteries	1. Press AUTO button and program batch size 2. Press RESET button 3. Check for battery icon / Replace batteries / Press RESET button

If the meter has anything wrong, please contact an authorized service center.
We don't recommend customers repair the meter themselves.

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